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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/796,330	03/09/2004	Shi-dong Zhou	X-1660 US	2114

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XILINX, INC  
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EXAMINER

TRAN, ANH Q

ART UNIT	PAPER NUMBER
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2819

DATE MAILED: 05/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/796,330

Applicant(s)

ZHOU, SHI-DONG

Examiner

Anh Q. Tran

Art Unit

2819

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 09 March 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-60 is/are pending in the application.
- 4a) Of the above claim(s) 5 and 17-60 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 7-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

The inventions are distinct, each from the other because of the following reasons:

1. This application contains claims directed to the following patentably distinct species of the claimed invention: Group I, claims 1-4, 6-16; Group II, claims 17-27.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, no claim is generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over

the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Furthermore,

2. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-16, drawn to multiplexer, classified in class 326, subclass 113.
  - III. Claims 28-60, drawn to PLD circuit, classified in class 326, subclass 41.
3. Inventions I and III are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the PLD device could use any multiplexer circuit. The subcombination has separate utility such as inverted inputs and latch output for use in any integrated circuit.
4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Lois D. Cartier on 5/18/05 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-4, 6-16. Affirmation of this election must be made by applicant in replying to this Office action.

Claims 5, 17-27, and 28-60 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 9-10, 12, 14-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Song et al (6,121,797).

Song shows:

1. A multiplexer circuit, comprising:

a first plurality of circuit input terminals (A, C, Fig. 5) providing a first plurality of input signals;

a second plurality of circuit input terminals ( $\bar{A}$ ,  $\bar{C}$ ) providing a second plurality of input signals having complementary values to the first plurality of input signals;

a circuit output terminal (226 or 227);

a first multiplexer (130) having a plurality of input terminals coupled to the first plurality of circuit input terminals, at least one select terminal (B), and an output terminal (T);

a second multiplexer (140) having a plurality of input terminals coupled to the second plurality of circuit input terminals, at least one select terminal (B) coupled to the at least one select terminal of the first multiplexer, and an output terminal (T bar); and

an output circuit (223) having a first input terminal (224) coupled to the output terminal of the first multiplexer, a second input terminal (225) coupled to the output terminal of the second multiplexer, and an output terminal coupled to the circuit output terminal,

wherein the first and second multiplexers are configured to select a corresponding one of their respective input terminals in response to equivalent signals received at their respective select terminals.

9. The multiplexer circuit of Claim 1, wherein the output circuit comprises a latch (221 & 222).

10. The multiplexer circuit of Claim 9, comprises first (221) and second (222) cross-coupled wherein the latch inverters.

14. The multiplexer circuit of Claim 1, wherein the first and second multiplexers each comprise a plurality of transistors coupled in series between their respective input and output terminals, and all of the transistors consist of N-channel transistors (Mn9-Mn20).

12. The multiplexer circuit of Claim 1, wherein the output circuit comprises:

an inverter (Mp25 & Mn25) having an input terminal (224) coupled to the output terminal of the second multiplexer (coupled by Mp28, Mp26, Mn26) and an output terminal (226) coupled to the output terminal of the first multiplexer (coupled by Mp 27);  
and

a P-channel transistor (Mp26) coupled between the output terminal of the second multiplexer and a power high terminal, the P-channel transistor having a gate terminal

(225) coupled to the output terminal of the first multiplexer (coupled through Mp27) and further coupled to the circuit output terminal (coupled through Mp27).

15. The multiplexer circuit of Claim 1, wherein the first and second multiplexers comprise binary multiplexers.

16. The multiplexer circuit of Claim 1, wherein the first and second multiplexers comprise one-hot multiplexers.

3. Claims 1, 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Allen et al (6,232,799).

Allen shows:

1. A multiplexer circuit (Fig. 4), comprising:

a first plurality of circuit input terminals (D0-3 Fig. 4) providing a first plurality of input signals;

a second plurality of circuit input terminals (D0\_L – D3\_L) providing a second plurality of input signals having complementary values to the first plurality of input signals;

a circuit output terminal (OUT);

a first multiplexer (X circuit) having a plurality of input terminals coupled to the first plurality of circuit input terminals, at least one select terminal (S0), and an output terminal (X);

a second multiplexer (X<sub>L</sub> circuit) having a plurality of input terminals coupled to the second plurality of circuit input terminals, at least one select terminal (S<sub>0</sub>) coupled to the at least one select terminal of the first multiplexer, and an output terminal (X<sub>L</sub>); and

an output circuit (P<sub>0</sub>, P<sub>1</sub> and inverters) having a first input terminal (X) coupled to the output terminal of the first multiplexer, a second input terminal (X<sub>L</sub>) coupled to the output terminal of the second multiplexer, and an output terminal coupled to the circuit output terminal,

wherein the first and second multiplexers are configured to select a corresponding one of their respective input terminals in response to equivalent signals received at their respective select terminals.

11. The multiplexer circuit of Claim 1, wherein the output comprises:

an inverter (inverter coupled to OUT terminal) having an input terminal coupled to the output terminal of the first multiplexer and an output terminal coupled to the circuit output terminal;

a first pullup (P<sub>0</sub>) coupled between the output terminal of the first multiplexer and a power high terminal, the first pullup having a gate terminal coupled to the output terminal of the second multiplexer; and

a second pullup (P<sub>1</sub>) coupled between the output terminal of the second multiplexer and the power high terminal, the second pullup having a gate terminal coupled to the output terminal of the first multiplexer.



***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2-3, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Allen et al (6,232,799) in view of Sako (6,084,437).

2-3. Allen discloses the claimed invention except for a plurality of inverters coupled between the first input terminals and the second input terminals. Sako discloses that is known in the art to provide a plurality of inverters coupled between the first input terminals and the second input terminals (I1-I3, Fig. 9). It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the second input terminals of Allen with inverters of Sako, in order to provide complementary input signals.

13. Allen discloses the claimed invention except for each comprise eight input terminals. It would have been obvious to one having ordinary skill in the art at the time the invention was made to implement each multiplexer having eight input terminals, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

6. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being obvious over Song et al (6,121,797) in view of Young et al (6,768,338).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(I)(1) and § 706.02(I)(2).

Song discloses the claimed invention except for:

at least one memory cell coupled to the select terminals of first and second multiplexers.

An inverter coupled between the two select terminals.

Young discloses that it is known in the art to provide:

at least one memory cell coupled to the select terminals of first and second multiplexers (Fig. 10).

An inverter coupled between the two select terminals (Fig. 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the multiplexer of Song with:

at least one memory cell coupled to the select terminals of first and second multiplexers or an inverter coupled between the two select terminals of Young, in order to control the selected terminals.

***Allowable Subject Matter***

7. Claims 4, 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anh Q. Tran whose telephone number is 571-272-1813. The examiner can normally be reached on M-TH (7:00-5:30) Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Tokar can be reached on 571-272-1812. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ANH Q. TOAN  
PRIMARY EXAMINER



5/18/05